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ABSTRACT

The Office of Research and Evaluation of the Dearborn Public Schools (Michigan) presents a longitudinal study to analyze grade nine student academic growth over a 2-year period utilizing the results of the Tests of Achievement and Proficiency (TAP). The TAP is a nationally normed test designed to assess student progress toward widely accepted secondary school goals in the basic skills and basic curriculum areas. The TAP, rather than being content specific, emphasizes student skills and the ability to use information. The TAP was administered to grade 9 and grade 11 students during May in 1978 through 1981. During both October 1979, and October 1980, staff in-service sessions were conducted which emphasized making effective use of the TAP test data. It was determined that a study of same students from grades 9 to 11 would help determine the effectiveness of the high school curriculum. Discussed are: (1) 4-year achievement trends, (2) analyses of variance of achievement gains by high school, (3) the city grade 9 to 11 achievement trend, (4) the student population, (5) comparison of achievement of students who left school and new students, (6) 2-year gains by tests by achievement level, and (7) interpretation and instructional use of TAP longitudinal achievement data. (PN)

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BULLETIN NO. 1191 Dr. Douglas B. Lund, Superintendent September 30, 1981

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GRADE NINE THRU GRADE ELEVEN LONGITUDINAL ACHIEVEMENT STUDY

UTILIZING THE TESTS OF ACHIEVEMENT AND PROFICIENCY

MAY 1978 TO MAY 1980

AND

MAY 1979 TO MAY 1981

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Office of Research and Evaluation

Public Schools

Dearborn, Michigan

TM 830 444

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GRADE NINE THRU GRADE ELEVEN LONGITUDINAL ACHIEVEMENT STUDY
UTILIZING THE TESTS OF ACHIEVEMENT AND PROFICIENCY

PURPOSE

The purpose of the longitudinal study is to analyze grade nine student academic growth over a two-year period utilizing the results of the Tests of Achievement and Proficiency.

BACKGROUND

The Tests of Achievement and Proficiency (TAP) has been administered to grade nine and grade eleven students during May in 1978 thru 1981. During both October, 1979, and October, 1980, staff in-service sessions were conducted which emphasized making effective use of the TAP test data. A six-member team representing the academic areas, counseling and building administration from each junior high school and senior high school attended. It was determined that a study of same students from grade nine to grade eleven would help determine the effectiveness of the high school curriculum.

TAP DESCRIPTION

The TAP is a nationally normed test designed to assess student progress toward widely accepted secondary-school goals in the basic skills and basic curriculum areas. The TAP emphasizes student skills and the ability to use information rather than being content specific.

There are six forty-minute tests including:

READING COMPREHENSION--measures competency in work-type reading and is concerned with facts, inferences and generalizations.

MATHEMATICS--measures basic math skills utilized in everyday living and understanding of basic math principles.

WRITTEN EXPRESSION--measures skills (spelling, capitalization, punctuation, grammar and usage, organization and form) for expressing ideas in writing.

USING SOURCES OF INFORMATION--measures students' skills in using maps, charts, graphs, index, table of contents, dictionary, and being able to locate information in standard references.

SOCIAL STUDIES--measures social studies (economic, geographic, political, social and anthropology) concepts, principles, themes, issues and problems in the inter-actions among people and between people and their environment.

SCIENCE--measures fundamentals (knowledge, concepts and principles) of science and use of scientific reasoning in the areas of biology, nature of science, earth and space science, physics, and chemistry.

The COMPOSITE percentile score is based on the standard score average of the six named tests.

The TAP results can be used to help analyze individual student and groups of students strengths and weaknesses, and to follow a student's academic growth through the high school program. The results can also be helpful in the planning of instruction and the revising of courses of study and instructional activities.

FOUR-YEAR ACHIEVEMENT TRENDS

The grade eleven TAP Composite percentile results has consistently increased over the four years. The mean Composite score has increased from 53 in 1978, to 54 in 1979, to 56 in 1980 and to 57 in 1981.

ANOV OF ACHIEVEMENT GAINS BY HIGH SCHOOL

When a statistical analysis of various tests was calculated to compare the difference between the tests standard scores among the high schools, a statistical significance would be found in the following content areas at the five percent confidence level:

May 1978 to May 1980	May 1979 to May 1981
Mathematics	
Using Sources of Information	
Social Studies	Social Studies
Science	Science
	Composite

CITY GRADE NINE TO GRADE ELEVEN ACHIEVEMENT TREND

The City average percentile results of the Tests of Achievement and Proficiency for the grade nine and eleven students are as follows:

	GRADE 9 MAY 1978	GRADE 11 MAY 1980	TWO YEAR GROWTH	GRADE 9 MAY 1979	GRADE 11 MAY 1981	TWO YEAR GROWTH
READING COMPREHENSION	51	54	+3	55	55	+0
MATHEMATICS	58	59	+1	59	60	+1
WRITTEN EXPRESSION	58	54	-4	54	56	+2
USING SOURCES OF INFORMATION	53	57	+4	55	59	+4
SOCIAL STUDIES	58	58	+0	54	58	+4
SCIENCE	55	55	+0	50	56	+6
COMPOSITE	56	56	+0	55	57	+2
N=	1414	1315		1370	1296	

The 1978 to 1980 Composite percentile scores resulted in normal growth (+0 percentile points) over the two years with percentile scores of 56. The curriculum area with the greatest growth is Using Sources of Information

(+4 percentile points) followed by Reading Comprehension (+3 percentile points). It seems that a less than normal growth of a negative 4 percentage points occurred in Written Expression.

The 1979 to 1981 results show a greater than normal growth with a Composite score increase of 2 percentile points. The greatest growth is shown in Science (+6 percentile points) followed by Using Sources of Information (+4 percentile points) and Social Studies (+4 percentile points).

THREE GROUPS OF STUDENTS

As shown, the number of students tested as grade nine in 1978 (1,414 students) differs from the number of grade eleven students tested in 1980 (1,315 students). Similar differences occur when examining the 1979-1981 results.

In order to effectively analyze grade nine to grade eleven TAP results, three groups of students were identified. First, those students who were in school during the two years--the "study group." Second, are those students who were tested in grade nine but not in grade eleven--"students who left school." And third, those students not tested in grade nine but were tested in grade eleven---"new students."

When one analyzes two-year achievement growth a number of questions arise. What influence did the "students who left school" and the "new students" have upon the City results? Was there normal growth in each curricular area for the "study group?" In which curricular areas did the students achieve the greatest or the least? Was there a difference in growth among the high or low achieving groups of students?

To obtain the same-students "study group" growth the grade eleven test result print-out was used. Grade nine test results were recorded along with the student identification number, high school, junior high school and sex. The standard scores for each test were used for the statistical analysis. All the data was entered into a computer file and was subsequently analyzed by a computer program called the Statistical Package for the Social Sciences (SPSS).

COMPARISON OF ACHIEVEMENT OF STUDENTS WHO LEFT SCHOOL AND NEW STUDENTS

The 1978 to 1980 Composite percentile score for the "students who left school" of 46 was higher than the "new students" score of 38. Furthermore, the school ability score (DIQ) for the "students who left school" of 103.3 was higher than the school ability score of 99.5 for the "new students." The comparisons are similar for the 1979-1981 groups of students.

The highest school ability and school achievement scores are shown for those students who received their instruction in the Dearborn schools over the two years--the "study group."

TWO-YEAR GAINS BY TESTS OF ACHIEVEMENT LEVELS

The average score gain for the study group provides evidence that there was more than normal growth in various areas over the two years. One may

question, however, whether there was a difference in the amount of growth between the high achieving students and the low achieving students. Further analysis of the test data helped to provide some additional information in regard to this concern.

In each "test" the students were classified into an "achievement level" based upon the students grade nine standard scores and equivalent percentile score as follows:

ACHIEVEMENT LEVEL	PERCENTILE SCORE
HIGH	76 or higher
MIDDLE HIGH	51 to 75
MIDDLE LOW	26 to 50
LOW	25 or lower

It is possible for an individual student to be classified into different achievement levels for different tests. For example, a grade nine student with a percentile score of 79 in Reading Comprehension and a 60 in Math would be classified in the HIGH Reading Comprehension achievement level and the MIDDLE HIGH in Math.

Although the Composite gain by achievement level groups is similar, the gains for each test is noticeably unique. For example, tht AVERAGE gain in 1978 to 1980 Reading Comprehension is 13.3 while the HIGH gain is 8.8 and the LOW gain is 19.5. The general pattern of gains shows that the LOW had the largest gains while the HIGH had the smallest gains. Also, the standard score gains for each test ranged from an average of 10.4 in Math to 17.7 in Science for the May 1978 to May 1980 results. Similar data is shown for the May 1979 to May 1981 results.

The next question then is: How do these achievement gains compare to normal achievement growth over the two years? In order to make the comparison we examine the standard score gains for the national norms group.

The national norm grade eleven standard score minus the grade nine standard score represents the "Normal" gain over the two-year period. However, since there is not an equal standard score growth for the tests nor for different achievement levels, it was necessary to calculate the normal gains separately by test and achievement levels. Standard scores equivalent to the 85th, 64th, 35th and the 15th percentile levels were used to represent the achievement level classifications of the HIGH, MIDDLE HIGH, MIDDLE LOW, and the LOW respectively.

Comparison of Dearborn's student standard score gains with normal standard score gains by test and achievement levels shows a significant +4.2 Composite gain for the LOW group in 1978 to 1980. The other achievement level classifications gains are within 0.5 of the normal or "expected" gain. The 1979 to 1981 results report greater than normal growth for the Composite scores of the MIDDLE LOW and LOW student groups.

The LOW and MIDDLE LOW student groups show significant greater than normal growth in all content areas. The HIGH achieving student consistently shows a less than normal growth in all content areas.

INTERPRETATION AND INSTRUCTIONAL USE OF TAP LONGITUDINAL ACHIEVEMENT DATA

Any interpretation of the TAP longitudinal achievement data must consider the purpose and reliability of the test, the fact that it assesses a national generalized curriculum and basic student skills, the content validity of the test, the instructional emphasis, the instructional sequence, and that the test cross-over several disciplines. Obviously, the level of teacher and/or student achievement expectation is important.

This longitudinal achievement study of Dearborn high school students over a two-year period suggests the following possible conclusions:

1. Students who have received instruction in the Dearborn schools (study group) over the two-year period have significant achievement gains in Using Sources of Information, Social Studies, and Science. Achievement gains in Reading Comprehension, Mathematics, and Written Expression are normal as expected.

2. The school ability and school achievement of those grade nine "students who left school" are higher than those "new students" who came from other school districts.

3. Significant achievement gains over the two years are shown for all Dearborn students, except the HIGH achievement level, in the content areas of Using Sources of Information, Social Studies, and Science.

4. The lower half of Dearborn students show more than normal growth in the areas of Reading Comprehension and Written Expression, while the upper half of Dearborn students show less than normal or expected growth.

5. In the area of Mathematics Dearborn LOW students show significant achievement growth while the HIGH students show a lack of growth.

6. Dearborn's instructional program and curriculum excels in providing for basic skills of the LOW and MIDDLE LOW students in all curricular areas as assessed by the TAP. This conclusion is reinforced by both the 1978 to 1980 test data and the 1979 to 1981 test data.

7. The HIGH achieving students have a less than normal achievement growth over the two years in all curricular areas. There are several plausable reasons why this may have occurred.

   A. First the TAP assesses a national generalized curriculum and basic skills - consequently, the instructional content of advanced classes may <u>not</u> be assessed by the TAP tests.

   B. Teacher and/or student achievement expectations are not high enough.

   C. Since these HIGH students are in advanced classes the teacher may have assumed that the basic skills have previously been mastered by the students and as a result the opportunity for reinforcement or review of the basic skills was limited in the instructional program.

D. The TAP tests content cross-over several disciplines, consequently teachers may have assumed that the students have learned certain skills in other disciplines.

8. The students in the MIDDLE HIGH achievement levels have significant achievement growth in Using Sources of Information and Science and less than normal growth in Written Expression.

9. Greater opportunity for the MIDDLE HIGH and HIGH students to improve their language art skills needsto be provided by the instructional program.

It should be remembered that an analysis of norm-referenced test results helps to provide objective information useful in making curriculum and instructional decisions. However, such decisions should not be made on the basis of test results alone but should be utilized in conjunction with other information also.

TABLE IV

COMPARISON OF TESTS OF ACHIEVEMENT AND PROFICIENCY

CITY GRADE NINE RESULTS

MAY, 1978, THROUGH MAY, 1981

PERCENTILE SCORES

	READING COMPREHENSION			MATHEMATICS			WRITTEN EXPRESSION			USING SOURCES OF INFORMATION			
MAY	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	
1978	76	51	33	79	58	37	78	58	32	77	53	35	
1979	76	55	31	81	59	35	79	54	30	75	55	31	
1980	76	54	29	81	57	31	79	56	34	78	56	29	
1981	75	52	29	80	57	35	77	55	32	73	52	29	

	BASIC COMPOSITE			SOCIAL STUDIES			SCIENCE			COMPOSITE			
MAY	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	N =
1978	NA	56	NA	78	58	34	78	55	33	78	56	36	1414
1979	77	56	32	76	54	29	73	50	27	76	55	32	1370
1980	79	56	30	76	55	31	75	51	27	78	56	29	1168
1981	77	55	32	76	54	29	75	49	26	77	54	31	1156

TABLE V

COMPARISON OF TEST OF ACHIEVEMENT AND PROFICIENCY

CITY GRADE ELEVEN RESULTS

MAY, 1978, THROUGH MAY, 1981

PERCENTILE SCORES

	READING COMPREHENSION			MATHEMATICS			WRITTEN EXPRESSION			USING SOURCES OF INFORMATION		
MAY	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1
1978	75	50	31	78	55	33	75	54	34	77	49	32
1979	76	53	29	80	58	32	74	51	30	76	54	31
1980	76	54	32	80	59	32	77	54	30	80	57	32
1981	77	55	32	81	60	32	77	56	31	82	59	34

	BASIC COMPOSITE			SOCIAL STUDIES			SCIENCE			COMPOSITE			
MAY	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	Q_3	MEAN	Q_1	N =
1978	NA	57	NA	79	53	33	79	56	32	77	53	33	1556
1979	76	53	31	79	58	35	78	56	31	76	54	31	1436
1980	78	55	30	79	58	35	78	55	31	78	56	31	1315
1981	79	57	31	79	58	35	78	56	31	79	57	32	1296

TESTS OF ACHIEVEMENT AND PROFICIENCY

ANALYSES OF VARIANCE

ACHIEVEMENT GAINS BY HIGH SCHOOLS

MAY 1978 TO MAY 1980

TAP SUBTEST ACHIEVEMENT GAINS	F RATIO	F PROBABILITY	SIGNIFICANCE
READING	1.113	0.3289	N.S.
MATHEMATICS	7.651	0.0005	SIGNIFICANT $<.001$
WRITTEN EXPRESSION	1.861	0.1560	N.S.
USING SOURCES OF INFORMATION	7.056	0.0009	SIGNIFICANT $<.001$
SOCIAL STUDIES	20.028	0.0000	SIGNIFICANT $<.0001$
SCIENCE	12.389	0.0000	SIGNIFICANT $<.0001$
COMPOSITE	1.870	0.1546	N.S.

MAY 1979 TO MAY 1981

TAP SUBTEST ACHIEVEMENT GAINS	F RATIO	F PROBABILITY	SIGNIFICANCE
READING	1.525	0.2181	N.S.
MATHEMATICS	0.817	0.4421	N.S.
WRITTEN EXPRESSION	2.959	0.0523	N.S.
USING SOURCES OF INFORMATION	1.546	0.2135	N.S.
SOCIAL STUDIES	5.754	0.0033	SIGNIFICANT $<.01$
SCIENCE	5.802	0.0031	SIGNIFICANT $<.01$
COMPOSITE	3.793	0.0228	SIGNIFICANT $<.05$

DIFFERENT GROUPS OF DEARBORN STUDENTS
MAY 1978 TO MAY 1980
TESTS OF ACHIEVEMENT AND PROFICIENCY
MEAN PERCENTILE SCORES

	CITY			SAME STUDENTS "STUDY GROUP"			GRADE 9* MAY 1978 STUDENTS WHO LEFT SCHOOL N=324	GRADE 11 MAY 1980 NEW STUDENTS N=225
	GRADE 9 MAY 1978 N=1414	GRADE 11 MAY 1980 N=1315	GAIN	GRADE 9 MAY 1978 N=1090	GRADE 11 MAY 1980 N=1090	GAIN		
READING COMPREHENSION	51	54	+3	57	57	+0	31	36
MATHEMATICS	58	59	+1	62	61	-1	45	46
WRITTEN EXPRESSION	58	54	-4	58	57	-1	58	40
USES OF SOURCES OF INFORMATION	53	57	+4	59	60	+1	33	38
SOCIAL STUDIES	58	58	+0	57	61	+4	61	42
SCIENCE	55	55	+0	54	60	+6	58	37
COMPOSITE	56	56	+0	59	58	-1	46	38
OTIS-LENNON DEVIATION INTELLIGENCE QUOTIENT	105.1	106.3		107.2	107.2		103.3	99.5

*EXTRAPOLATED SCORES

DIFFERENT GROUPS OF DEARBORN STUDENTS
MAY 1979 TO MAY 1981
TESTS OF ACHIEVEMENT AND PROFICIENCY
MEAN PERCENTILE SCORES

	CITY			SAME STUDENTS "STUDY GROUP"			GRADE 9* MAY 1979 STUDENTS WHO LEFT SCHOOL N=215	GRADE 11 MAY 1981 NEW STUDENTS N=141
	GRADE 9 MAY 1979 N=1370	GRADE 11 MAY 1981 N=1296	GAIN	GRADE 9 MAY 1979 N=1155	GRADE 11 MAY 1981 N=1155	GAIN		
READING COMPREHENSION	55	55	+0	58	57	-1	39	36
MATHEMATICS	59	60	+1	63	62	-1	38	41
WRITTEN EXPRESSION	54	56	+2	57	63	+6	38	33
USES OF SOURCES OF INFORMATION	55	59	+4	58	57	-1	39	35
SOCIAL STUDIES	54	58	+4	56	60	+4	43	40
SCIENCE	50	56	+6	53	58	+5	34	38
COMPOSITE	55	57	+2	58	59	+1	39	36
OTIS-LENNON DEVIATION INTELLIGENCE QUOTIENT	104.9	105.8		106.6	106.6		101.5	97.5

*EXTRAPOLATED SCORES

TESTS OF ACHIEVEMENT AND PROFICIENCY

GRADE 9 TO GRADE 11 ACHIEVEMENT GAINS BY ACHIEVEMENT LEVELS BY STUDENTS

STANDARD SCORES

CITY

SAME STUDENTS - STUDY GROUP

1978-1980 N=1080 TO 1090
1979-1981 N=1151 TO 1155

MAY 1978 TO MAY 1980

ACHIEVEMENT LEVELS*	READING COMPREHENSION NO.**	READING COMPREHENSION GAIN***	MATHEMATICS NO.	MATHEMATICS GAIN	WRITTEN EXPRESSION NO.	WRITTEN EXPRESSION GAIN	USING SOURCES OF INFORMATION NO.	USING SOURCES OF INFORMATION GAIN	SOCIAL STUDIES NO.	SOCIAL STUDIES GAIN	SCIENCE NO.	SCIENCE GAIN	COMPOSITE NO.	COMPOSITE GAIN
HIGH	330	8.8	369	10.5	313	6.1	277	12.3	308	12.7	267	13.6	311	14.5
MIDDLE HIGH	322	12.8	313	8.9	306	12.5	366	18.4	292	16.4	302	16.3	334	14.3
MIDDLE LOW	251	15.4	245	9.9	285	13.8	309	16.7	316	16.6	309	17.5	282	13.4
LOW	186	19.5	163	13.8	183	22.8	138	18.5	174	28.2	212	25.4	153	16.2
AVERAGE		13.3		10.4		12.7		16.4		17.3		17.7		14.4

MAY 1979 TO MAY 1981

HIGH	332	8.8	404	10.0	355	7.0	288	14.1	318	12.4	273	10.2	325	14.5
MIDDLE HIGH	357	12.1	320	10.0	289	12.9	389	19.4	316	15.1	317	15.8	367	14.5
MIDDLE LOW	298	15.3	253	9.1	306	15.5	301	18.1	315	19.0	316	18.5	281	15.4
LOW	168	16.9	178	12.6	201	25.6	175	22.3	205	25.3	249	24.4	179	15.6
AVERAGE		12.7		10.2		14.0		18.2		17.2		17.1		14.9

*The classification of students into "achievement levels" is based upon the students grade 9 TAP standard scores. A standard score equivalent to a 76 percentile score or higher is a HIGH achievement level. The MIDDLE HIGH achievement level is for percentile scores of 51 to 75. The MIDDLE achievement level is for percentile scores of 26 to 50. The 25 percentile score or lower is the LOW achievement level. The AVERAGE is the mean or 50th percentile score.

**The number of students in an achievement level may be different for each subtest. For example, a grade 9 student with a percentile score of 79 in Reading and a 60 in Math would be in the HIGH Reading groun and the MIDDLE HIGH in Math.

***The standard score "gain" is the grade 11 standard score minus the grade 9 standard score.

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TESTS OF ACHIEVEMENT AND PROFICIENCY

STANDARD SCORE NORMS GAIN

MAY GRADE 9 TO MAY GRADE 11

	READING COMPREHENSION	MATHEMATICS	WRITTEN EXPRESSION	USING SOURCES OF INFORMATION	SOCIAL STUDIES	SCIENCE	COMPOSITE
THIRD QUARTILE (Q_3)	207	200	207	212	208	207	207
	-193	-189	-193	-197	-193	-193	-192
	14	11	14	15	15	14	15
SECOND QUARTILE (Q_2)	187	183	185	191	190	190	188
	-174	-173	-172	-176	-176	-176	-174
	13	10	13	15	14	14	14
FIRST QUARTILE (Q_1)	166	167	163	169	173	172	170
	-155	-158	-151	-155	-159	-158	-157
	11	9	12	14	14	14	13
85 PERCENTILE	218	209	219	223	217	217	216
	-203	-197	-204	-207	-202	-202	-201
	15	12	15	16	15	15	15
64 PERCENTILE	198	192	197	202	200	199	198
	-185	-182	-183	-187	-185	-185	-184
	13	10	14	15	15	14	14
35 PERCENTILE	176	174	173	178	180	180	178
	-164	-165	-160	-165	-164	-166	-165
	12	9	13	13	16	14	13
15 PERCENTILE	155	157	150	158	161	162	160
	-145	-149	-139	-144	-149	-148	-148
	10	8	11	14	12	14	12

COMPARISON OF GRADE 9 TO GRADE 11 ACHIEVEMENT GAIN TO NORMAL GAIN BY ACHIEVEMENT LEVELS

TESTS OF ACHIEVEMENT AND PROFICIENCY

STANDARD SCORES

SAME STUDENTS - STUDY GROUP

CITY

MAY 1978 TO MAY 1980

ACHIEVEMENT LEVELS	READING COMPREHENSION	MATHEMATICS	WRITTEN EXPRESSION	USING SOURCES OF INFORMATION	SOCIAL STUDIES	SCIENCE	COMPOSITE
HIGH	-6.2*	-1.5*	- 8.9*	-3.7*	- 2.3*	- 1.4*	-0.5
MIDDLE HIGH	-0.2	-1.1*	- 1.5*	+3.4*	+ 1.4*	+ 2.3*	+0.3
MIDDLE LOW	+3.4*	+0.9*	+ 0.8*	+3.7*	+ 0.6*	+ 3.5*	+0.4
LOW	+9.5*	+5.8*	+11.8*	+4.5*	+16.2*	+11.4*	+4.2*
AVERAGE	+0.3	+0.4	- 0.3	+2.4*	+ 3.3*	+ 3.7*	+0.4

MAY 1979 TO MAY 1981

ACHIEVEMENT LEVELS	READING COMPREHENSION	MATHEMATICS	WRITTEN EXPRESSION	USING SOURCES OF INFORMATION	SOCIAL STUDIES	SCIENCE	COMPOSITE
HIGH	-6.2*	-2.0*	- 8.0*	-[illegible].9*	- 2.6*	- 4.8*	-0.5
MIDDLE HIGH	-0.9*	+0.0	- 1.1*	+4.4*	+ 0.1	+ 1.8*	+0.5
MIDDLE LOW	+3.3*	+0.1	+ 2.5*	+5.1*	+ 3.0*	+ 4.5*	+2.4*
LOW	+6.9*	+4.6*	+14.6*	+8.3*	+13.3*	+10.4*	+3.6*
AVERAGE	-0.3	+0.2	+ 1.0*	+3.2*	+ 3.2*	+ 3.1*	+0.9*

*SIGNIFICANT AT THE FIVE PERCENT CHANCE LEVEL